Increasing the Power Efficiency for Communication Between IoT Devices Using Source and Channel Coding

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Internet of Things (IoT) applications are increasingly being adopted in many sectors. Such applications rely on networks of limited-power interconnected IoT devices to deliver useful services. Low Power Wide Area Networks (LPWAN) is a wireless networking technology that enables IoT devices to communicate and exchange information while saving power resources. However, certain applications tend to send data packets with higher sizes and data rates, which can result in increased power consumption. LPWAN also suffers from being error-prone, meaning that it is more likely to be affected by noise. To overcome these challenges, the system in this project was developed using a source and channel coding system that will both compress the size of data and maintain reliable communication even over a noisy channel. Simulations show that the system produces better average results in both compression rate and time compared to other compression techniques. The bit error ratio has also decreased compared to the original uncoded data. The combined effect of reducing data sizes and increased reliability makes the design well suited for IoT applications.

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